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Do you "Hear" the Gap in Higher Education?

Eighteen percent. Only 18% of the hearing loss population earn a bachelor's degree compared to 33% of the hearing population (Garberoglio et al. 4). The gap is almost a fifty percent difference. Even more alarming is that 51% of the hearing loss population begin college, but about 65% of those students drop out (Garberoglio et al. 4). People with hearing loss in this essay encompass hard of hearing and Deaf individuals. Hard of hearing individuals are people who primarily communicate using spoken English, while Deaf people communicate using American Sign Language (ASL) ("Deafness and Hearing Loss"). Most people might know someone with hearing loss, either as a family member, friend, or coworker, but what is more problematic is that according to the World Health Organization, 5% of the world's population has hearing loss ("Deafness and Hearing Loss"). Having such a small proportion of people with hearing loss graduate from college poses immediate questions and it is imperative that people make changes to welcome more people who have hearing loss in higher education.

This essay explores some obstacles that students with hearing loss may face in pursuing higher education and that ultimately contribute to the gap between the achievement of hearing students and students with hearing loss in higher education. These barriers include having a later acquisition of language, not having enough technical vocabulary in ASL, and first and foremost, having insufficient methods in the classroom. These methods include presentations, classroom structure, and expectations set up by the instructor. The methods used in the classroom allows students to participate in discussions, engage in lectures and experience learning through a variety of other methods. By including a student with hearing loss in the classroom, an instructor allows the student to gain access to the learning material in a different mode. Not having that

additional access deters the student's learning growth and leads to less favorable outcomes for the student to pursue higher education. Although late language acquisition and the shortcomings of ASL are factors contributing to the gap of students with hearing loss in higher education, the main factor that contributes to this gap is the set of methods used in the classroom, which include presentation of materials, classroom structure, and expectations set up by the instructor. Without proper methods, the students will not be able to engage in higher education adequately.

The presentation of materials in a classroom greatly impacts the attainment of higher education of students with hearing loss (Henk et.al, 12). Many times, in higher education, there will be a large lecture hall with a PowerPoint presentation in the background, while the instructor writes on the blackboard and at the same time explains the material verbally to the class (Henk et.al, 12). This leads to information overload, which is when too much information is presented to be processed and learned (Eppler and Mengis 325). While hearing peers are struggling to integrate and note down all the instruction, students with hearing loss are further bogged down with additional modes of communication. For example, many students with hearing loss use assistive listening devices, which are small microphones that connect to the student's hearing aids or cochlear implants (Kim and Kim 105). Although they can hear some of what is being spoken, most students still focus visually on the instructor to pick up on cues on speech, colloquially known as lip reading (Kim and Kim 105) (Madhusoodanan, "Tuning into deaf needs"). Some students with hearing loss may also have American Sign Language (ASL) interpreters with them, so they may have to look at the interpreter, the instructor, and the material being presented that may be in different forms, such as in a PowerPoint, or on a blackboard (Berge et al. 187). Having so many forms of communication causes students to miss information that their hearing peers would not have missed (Marschark et al. 351). No matter what field the

student is studying in higher education, the subjects build upon each other (Hattie 2). If the student does not fully grasp a concept or misses information on some caveats in that topic, learning a higher-level topic would be difficult because they are unable to build ideas accurately upon each other (Hattie 2). Because hard of hearing and deaf students miss information at a higher frequency than their hearing peers, they are more likely not to be able to learn advance topics and achieve higher education (Marschark et al. 351). The presentation of materials falls under the classroom methods, which influences how likely a student with hearing loss can pursue higher education.

An example that clearly showcases the difficulty in pursuing higher education for students with hearing loss through the presentation of materials is in *New Beginnings,* which is a collection of personal narratives from people who are deaf. In one narrative by Kelly Kim, he explains to the reader about his childhood in a high school science classroom (Stinson and Buckley 67). He describes that in this classroom, the media is a PowerPoint presentation, which presents the question: should the child focus on the instructor or on the PowerPoint screen with other important scientific terms and diagrams? If he focuses on the PowerPoint presentation, he will be able to see the diagrams and definitions for vocabulary words, but he will miss any of the instructor's commentary that explains the diagram or connects the diagram to other concepts. Contrastingly, if he focuses on the instructor, he will be able to know the connections, but he will miss the visual representation of the diagram or any clarification of terms used in the lecture. In both cases, the ability to take notes during class is out of the question. Additionally, this example does not only apply to scientific fields, but all fields of study. At some point, there will be diagrams and terminology used in the humanities as well. With this diminished access to material taught in lecture, students who are hard of hearing or deaf struggle to keep up, which

contributes to their lack of motivation for continuing to higher education. The presentation of materials is a component of the methods used in a classroom, which is the main factor contributing to the gap in higher education.

The structure of the classroom also affects the ability of students with hearing loss to thrive in higher education. The structure of the classroom could be as concrete as the location of the students' desks, the position of the instructor in the room, and the lighting in the room (Caroline 518). Most of the time the hard of hearing or deaf student will prefer to sit near the front of the classroom or where the instructor usually positions themselves (Braun et al. 2). If there is a class discussion and the desks in the classroom are set in rows or in groups, the deaf or hard of hearing student may not be able to catch everything that the other students say and most likely miss the conversation. Sometimes the person talking may be on the other side of the classroom, or the person talking may be blocked by another person, so the student will not be able to either hear or understand the peer clearly. This causes the student to be unable to experience peer engagement and learning. Peer engagement is critical to learning in classroom. According to a study published in 2013 in the *American Journal of Community Psychology,* researchers looked at how the amount of peer engagement in the classroom impacts behavior and academic achievement in an elementary school (Capella 368). They found that peer engagement improved academic achievement and behavior significantly (Capella 368). If hard of hearing students and deaf students are not able to interact with peers adequately, they will be at a disadvantage and not have the academic achievement that their hearing peers will be able to reach.

The position of the instructor in the classroom faces the same problems for students as the structure of class discussion (Braun 3). If the instructor is constantly moving from one side

of the classroom to another, the student is most likely going to miss some of what is said if not all. Finally, the lighting in the room also affects the hard of hearing or deaf student's ability to follow the class lessons for more obvious reasons. If the room is dark, the student cannot see the instructor's face, and thus misses visual cues for understanding the speech in the lesson (Caroline 519). While the classroom structure discusses the lighting in the room and the location of the students desks and the instructor, a scenario that showcases the problem in lighting is one that is described in the *Journal of Deaf Studies and Deaf Education* where the lighting in the room was in fact excessive (Caroline 519). The excessiveness of the light caused "dazzle effects" on the background of where the instructor was talking, causing a visual distraction (Caroline 519). The "dazzle effects" were like spotlights that constantly flickered in the background of the instructor (Caroline 519). With a student who is visually focused on the instructor, the "dazzle effects" deter the student from being engaged in the classroom because they are distracted by the lights (Caroline 520). Researchers intervened in this type of scenario and did a study, where they had three classrooms in a deaf and hard of hearing school and they implemented simple interventions. These interventions included changing the seating arrangement, controlling the lighting and limiting background noise. At the end of the study, all three classrooms had an increase of 50% in academic engagement and decrease of 75% of disruptiveness in the classroom (Caroline 522). This study points to increasing student engagement by changing the classroom structure because when the student is not engaged, their academic achievement decreases (Caroline 522). They are unlikely to be able to keep up in the class material. This subsequently contributes to the gap in the higher education of hard of hearing and deaf people. The physical features of a classroom fall under the methods used in a classroom, which is the main factor

contributing to the gap in higher education. The classroom structure impedes the students' ability for peer-to-peer and academic engagement.

The expectations set by the instructor play the last major role in the methods used in the classroom (Eriks-Brophy 63). The instructor may not have experience working with deaf or hard of hearing students or may have misconceptions of the abilities of the students. They may also make assumptions of their ability to learn in a classroom. Many times, the instructor does not even have to explicitly state their notions, but the student gets the message and is discouraged from further pursuing higher education (Eriks-Brophy 65). For example, according a Gallaudet University study in 2013, they found that "limited expectations" from teachers are passed on to parents, which eventually reaches the students (Szymanski et al. 9). Additionally, they found that professionals set expectations that are "too low" just because the student has hearing loss and that causes the parents or teachers to not provide those students as many opportunities as they would for a hearing student (Szymanski et al. 9). Because of this contrast, any experience or opportunity allows a student to learn in a different environment and advance their thinking. If the student is unable to get access to these experiences, they fall behind in the amount of knowledge that their hearing peers acquire and are unable to pursue higher education to the degree of their hearing peers. Another study in 2014 supported Gallaudet University's findings when they wrote that deaf and hard of hearing students who had higher expectations fared better and were able to pursue academic achievement because they were pushed to their full potential (Hayes 2). On average, students who are deaf or hard of hearing are receiving lower expectations than their hearing peers which greatly impacts the classroom environment and thus the students' ability to be ready and pursue higher education (Hayes 3). Classroom methods are the main contributor to the gap in higher education because of the aforementioned factors of

classroom methods including the presentation of materials, the physical structure of the classroom, and the expectations set up by the instructor for the students.

Some opponents of classroom methods being the main factor of the gap in higher education may point towards children with hearing loss on average having a later language acquisition than that of hearing children. The late language acquisition impacts the hard of hearing and deaf children to enter higher education. Everything builds off language, such as learning new ideas and conversing with others in general. When a child is young, he or she acquires language through listening to other adults and children; however, if the child has hearing loss, he or she is unable to communicate effectively without intervention, according to *American Scientist* author Richard P. Meier in his journal article, " Language Acquisition by Deaf Children" (Meier 60). Depending on what age the hearing loss is detected, children who have some degree of deafness are most likely behind in their language development (Meier 63). Those children require either learning ASL or spoken English, depending on the child's and family's needs. ASL provides children with access to express their ideas and interact with others as does spoken English, but there must be direct effort (Meier 63).

Neurologist Dr. Oliver Sack's *Seeing Voices* explores language development in hearing and deaf children when he dives into a case study of a young deaf boy who had no access to any interventions (Sacks 38). At the age of eleven years, the boy had no basis for language because "there was never any real attempt to teach him" (Sacks 39). Because the boy had no simple understanding of language, the deaf boy almost certainly will not be able to enter higher education discussions in any field or learn the material adequately. Although it is an extreme example, the longer the parents stall intervention, the lower the language outcomes for the child, supporting Meier's findings. Because many people who are deaf are behind in their language

development, they might not be able to comprehend the jargon that is present in any field of study in higher education and will be deterred from advancing in the field.

Although a later language acquisition is a factor that contributes to why deaf and hard of hearing students are not entering the higher education field, it is not the main factor because not all hard of hearing and deaf children are behind in language. In fact, according to a study done in 2016 and published in the *Journal for Deaf Studies and Deaf Education,* the researchers found that 7 to 10% of high school graduates with hearing loss were able to achieve a proficient literacy rate (Hrastinski 156). The methods used in the classroom affect the students more broadly because even if the children have enough language development, they will not be able to use that language and advance their learning in a higher education context because they will not have access to the classroom material.

In the Deaf community, opponents of classroom methods being the main factor of the gap in higher education may point towards how the Deaf population uses American Sign Language (ASL). They may further elaborate on ASL's shortcomings of enabling students to enter higher education because it does not have all the technical jargon that spoken English has. For the Deaf, ASL is their mode of communication, but it is a relatively young language ("Deaf History Timeline"). ASL was created from French Sign Language in 1817 ("Deaf History Timeline"). Compared to spoken English which began in the fifth century, ASL, although complex, is still in its primitive phase ("What are the origins of English language?"). It has signs for everyday conversation and some technical jargon for the higher education liberal arts; however, when transitioning to the science field even as early as middle school science, ASL falls short of allowing Deaf to be included in the conversations ("Workshop for Emerging Deaf and Hard of Hearing Scientists"). There are no universal signs for even common science terms, such as

carbon, neuron, or torque, causing misconceptions in students and inaccuracies that affect the later years ("Workshop for Emerging Deaf and Hard of Hearing Scientists"). To illustrate the consequences, in an American Society for Cell Biology study in Life Sciences Education done in 2018, the researchers observed how elementary school teachers would create signs for scientific terms for their Deaf students (Braun et al. 4). When the students went to high school, they learned other new signs for the scientific terms. Because the signs were different, the students did not realize that the signs were the same and could not put the two concepts in their head together (Braun et al. 4). For the need of an example, take an elementary school Deaf student learning that the sign for helium was a clap. Then, when the student went to high school and they encounter the word, "helium" again, the sign is the snapping of fingers. Now, the student does not know how to put the two signs together and understand the concept of helium, thinking that it is two separate concepts. Although this example is simple, when the level of science learning or in any other subject increases, the concepts become only more difficult to learn and the inconsistency and inaccuracy currently with ASL impedes the Deaf students' ability to thrive in higher education (Braun et al. 4).

In recent years, the Deaf community has made efforts to add more signs into its language, so that it will enable the community to enter the higher education field at a higher rate. For example, with a grant for the National Science Foundation and Google, the Deaf community has created a STEM-Forum, which hosts a database of scientific ASL signs, in order to make scientific signs universal ("STEM-Forum). However, everyone is not willing to change over. The older generation of Deaf people who have created their own signs for when they learned technical jargon for their field are resisting the change and do not want to change their signs that the have used for years. For example, Dr. Sarah Latchney, who is a deaf environmental

toxicologist, created her own signs for science terms and does not "want to fix" her signs (Jackel). She has already found a way to communicate and does not want to learn the new universal signs in ASL (Jackel). Although the lack of ASL signs for technical jargon does impede the student's ability to enter higher education, it is not the main factor contributing to this gap. In the United States, only 0.3% people are part of the Deaf community compared to 5% who have some degree of hearing loss (Mitchell et al. 360). Because the Deaf community is smaller compared to the whole hearing loss population, the obstacle of ASL accessibility is not the main problem in higher education. Also, just because ASL might be accessible to those in higher education does not mean that they will be sufficiently welcomed in the classroom and be able to have access to the material being taught.

The main factor that contributes to the gap in higher education between hearing students and students with hearing loss is the set of methods used in the classroom, which include presentations, classroom structure, and the expectations set up by the instructor. Even though students with hearing loss on average have a later acquisition of language and ASL is not sufficiently able to lead discussions in higher education, classroom methods impact the achievement in higher education the most. As one looks to the future, one should hope that the gap closes, but it will take time and energy to change the methods used in the classroom and one cannot expect all instructors to change immediately. Considering that the World Health Organization predicts by 2050 that one in ten people will have some degree of deafness, now is the time that people need to close the gap of the achievement in higher education of students with hearing loss ("Deafness and Hearing Loss").

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